

42. The golf ball of claim 40 wherein the polyol is polytetramethylene ether glycol.

43. A golf ball comprising:

sub B² }
A { a center having a diameter of about 1.42" and comprising 100 PPHR cis polybutadiene rubber, 20 PPHR zinc acrylate salt, 24.5 PPHR barium sulfate, 6 PPHR zinc oxide, 3 PPHR zinc stearate and 2.1 PPHR 1,1-di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane;

A { a thread winding layer comprised of polyisoprene rubber and having a thread size of 0.017" x 5/64" so that the thread layer thickness is about 0.08" and the combination of the core and thread windings has a diameter of about 1.58"; and,

A { a cover comprising the reaction product of 100 PPHR of toluene diisocyanate @ 6% nitrogen, carbon, oxygen content and polytetramethylene ether glycol, 13.2 PPHR of a curative comprising diethyl-2,4-toluenediamine and dimethylthio-2,4-toluenediamine at a 50:50 weight ratio and, 2.3 PPHR pigment so that the overall ball diameter is about 1.68".--

REMARKS

Responsive to the communication mailed May 13, 1999, Applicants provide the following remarks in an effort to correct the deficiencies cited by the Examiner, and to more particularly point out their invention. Reconsideration and reexamination are respectfully requested.

Claims 1-29 have been canceled. In their place, claims 30-

43 have been added to more particularly point out and distinctly claim that which the Applicants regard as the subject matter of their invention. Entry and consideration of claims 30-43 are respectfully requested.

In paragraphs 1-9, a number of the original claims have been rejected under 35 U.S.C. § 112, second paragraph. The claims that are the subject of the rejections have been canceled thereby rendering the rejections moot. Applicants submit that the rejections were taken into account in new claims 30-43 which replace claims 1-18. Entry and consideration of claims 30-43 are respectfully requested.

In paragraph 12 of the Office Action, claims 1-18 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 3-12 of copending Application No. 09/018,283.

Applicants will file a terminal disclaimer if and when allowable subject matter is noticed in the referenced applications.

In paragraph 13, claims 1-17 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-15 of copending Application No. 09/030,332.

Applicants will file a terminal disclaimer if and when allowable subject matter is noticed in the referenced applications.

Prior to addressing the substance of the Examiner's

rejections, a brief narrative setting forth the background of this invention appears to be desirable. In the past, professional and other highly proficient golfers employed a golf ball having a balata cover in order to achieve superior results on the golf course. Indeed, for the professional golfer, the balata covered golf ball was the golf ball of choice.

The balata ball was considered to be the golf ball of choice because it imparted a significant "click" and "feel", when struck with a golf club and the softness of the cover facilitated the ability to impart spin on the golf ball when struck. However, balata-covered golf balls have become increasingly expensive due to the dwindling supply of natural balata and the environmental problems associated with forming golf ball covers with balata.

An additional problem associated with balata-covered balls is their poor resistance to tearing. A thinly hit or mishit balata-covered golf ball will often tear and go out of round thereby rendering the golf ball essentially unplayable. Balata-covered golf balls are notorious for not having good durability characteristics. Only the most proficient golfers have the ability to play a balata-covered golf ball during an entire round without causing the golf ball to tear.

Accordingly, a search began to replace balata by another material for golf ball covers without sacrificing the "click" and "feel" properties and back spin potential of balata-covered golf balls. And, of course, it would be desirable that the replacement be more durable than balata. Among other materials,

polyurethane became a leading candidate to replace balata as the material of choice for golf ball covers.

The Examiner has cited patents teaching polyurethane golf balls. However, processing polyurethane has a number of problems associated with it. In order to form a polyurethane-covered golf ball, the core has to be dipped into a mold containing polyurethane prepolymer. Polyurethane prepolymers gel very quickly. These are all problems well understood by polymer chemists. It is believed that the present invention as claimed is directed to a great advance in the art in that by following the invention as set forth in the claims, a golf ball is produced that has excellent "click" and "feel" characteristics and will allow a golfer to impart adequate backspin. Polyurethane-covered golf balls also exhibit superior durability when compared to the prior art balata-covered golf balls particularly with respect to tearing.

Furthermore, and more significantly, from a patentability point of view, the chemistry is a chemistry that enables the ball to be produced on an assembly line. A key feature of the golf ball of the present invention is that the polyurethane employs a curing agent that is a mixture of a fast-reacting diamine and a diamine that has a reaction rate that is slower than the fast-reacting diamine. These two diamines enable the curing to take place at a rate which enables the core to be placed in the liquid polyurethane in the first instance in a first mold half and be inverted into a second mold half in the second part of the

process.

Furthermore, it is the combination of the particular diisocyanates claimed that is toluene diisocyanate, 4,4'-diphenylmethane diisocyanate, Isophorone diisocyanate which together with a polyol and the curing agent blend produce a cover with the properties of balata. These features are expressly and adequately set forth in the golf ball claims.

In paragraph 15, claims 1,3 and 9 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Isaac ('568).

Applicants respectfully traverse the rejections to the extent that they are applied to the claims as replaced by claims 30-43.

As stated above, claims 1,3 and 9 have been canceled which renders the rejections moot. The claims that have been added to replace claims 1,3 and 9 all recite the specific diisocyanates used in the covers of the claimed golf balls. Isaac is silent on the specific diisocyanates used. Accordingly, new claims 30-43 are not anticipated by Isaac. Furthermore, Isaac cannot have any § 103(a) applicability because Isaac does not teach the same polyurethane ball that applicants are claiming. Reconsideration and removal of the rejections are respectfully requested.

In paragraph 16, claims 1-17 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over kato et al. ('852) or GB 2301291, each in view of Wu ('673) and Isaac ('568) and Presswood ('298). Applicants respectfully traverse the rejections to the extent the rejections are applied to replacement claims 30-43.

Here again, the references simply do not disclose the polyurethane composition to which Applicants' claims are limited and thus are inappropriate. Furthermore, in claims 38-43, limitations drawn to the size of the golf ball center in a three-piece golf ball and core in a two piece golf ball are set forth.

The significance of these limitations is that the center or core diameter sizes claimed, are only possible due to the durability characteristics of polyurethane-based golf ball covers. Because of the durability, a relatively thin cover and large center or core can be used to make a golf ball in accordance with USGA golf ball size specifications. Prior art golf balls require a much thicker cover in order to preserve durability characteristics.

It is the core or center of a golf ball that is primarily responsible for the distance characteristics of golf balls. To optimize distance characteristics, golf ball manufacturers would like to increase the size of golf ball cores or centers. The polyurethane cover composition devised by the Applicants as set forth in the claims, enables golf balls to be made with large centers or cores. None of the references alone, or in combination teach a golf ball having the novel polyurethane composition and the large diameter center or core.

Applicants further submit that Presswood is totally irrelevant because its teachings do not relate, in any way, to golf balls. There is not teaching or motivation in Presswood that would motivate one having ordinary skill in the art to

combine the teachings of Presswood with any of the other references which are drawn to golf balls. Furthermore, Presswood does not disclose the exact diamine-based curing agent blend set forth in the claims. Accordingly, Applicants respectfully submit that new claims 30-43 are not rendered obvious by Presswood in combination with any of the other references. Reconsideration and removal of the rejections under 35 § 103 are respectfully requested.

In paragraphs 20 and 24, claims 18-29 have been rejected under 35 § 103(a) as being obvious of a number of references. Claims 18-29 are drawn to a process and apparatus for making polyurethane-covered golf balls. Without any concession to the correctness of the Examiner's position regarding the rejections of the process and apparatus claims, Applicants have elected to prosecute these claims in a continuation application. Thus, this response focuses on the remaining claims that are directed to golf balls, per se.

Applicants respectfully submit that in light of the present amendments and remarks, all the presently pending claims are now in a condition for allowance. Reexamination and reconsideration are, therefore, respectfully requested.

It is believed that no fees are currently due apart from the fee for a one-month extension of time submitted herewith. However, in the event of any inadvertent fee deficiency, please authorization is hereby granted to charge such deficiency to deposit account # 12-2147.